

Ballistic Testing Services

Report Number: BTR-12-06-2019-Sample 4B

Phone: 800-513-4291 Email: techsupport@CloseFocusResearch.com

CloseFocusResearch.com

Name: Midwest Glass Fabricators
Address: PO Box 1509, 100 Transfer Dr. Highland, MI 48357
Phone: Phone: 248-889-6246 / Mobile 248-249-0478

Report Date: December 6, 2019
Contact: Paul Mouton
Email: pmouton@mwgf.com

Ballistic Results

Project Summary

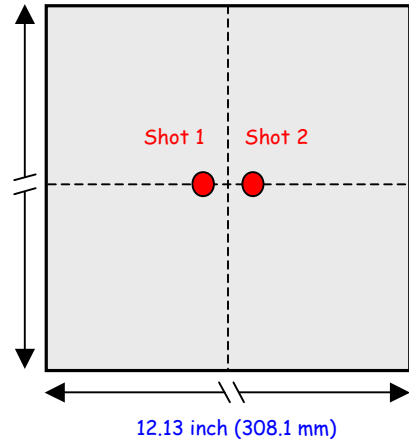
Type of Products to be tested: Bullet Resistant Glazings
Test Specimen Sample size(s): 12 x 12 inch
Number of test specimens: 23 Samples
Weight of all samples: 321.7 lbs
Are Materials a Health Hazard: No
Need the Tests performed by: within 7 to 10 days
Need products shipped back: No
Purchase Order Number: Not Applicable

International Ballistic Standards / Specifications Testing

ASTM Canadian FRA NIJ CFR Pass All
Australian EN1063 Germ DIN State Dept CFR SYA
British EN1522/23 MIL-SAMIT UL 752 Other
Test Standard: Underwriters Laboratory UL752 (Ambient Temp. Only)
Particular Test: UL Level 1 Part 2 (9 mm Parabellum FMJ)
Velocity Range: 1,175 to 1,293 ft/s
Shots: 2 shots
Shot Pattern: 1.25 to 1.75 inches

Test Results

Test Sample: Sample 4B
Part Number / D.O.M.: MWGF-UL1-ENBR2 / November 25, 2019 12.13 inch (308.1 mm)
Reference ID: CFR UL Level 1 and EN BR2
Description: Security Glazing
Sample Size: 12.13 x 12.13 inch (308.1 x 308.1 mm)
Thickness: 0.546 inch (13.87 mm)
Weight: 5.78 lbs (2.62 kg)
Weapon Type: 9 mm Parabellum
Cartridge / Projectile Type: 9 mm Parabellum FMJ
Projectile Weight: 124 grains
Target Distance: 15 feet
Number of Shots: 2 shots
Shot Sequence: Shot 1 Shot 2
Impact Velocity (ft/sec)\*: 1,182 1,202
Impact Energy (ft-lbs): 385 398
Impact Momentum (lb-sec.): 0.65 0.66
Impact Angle (degrees): 0° 0°
Sample Penetration: NP NP
Witness Plate Penetration: N/A N/A
Impact Spacing (inches)\*\*: N/A 1.50
Impact Spacing / Pattern: N/A
Witness plate material: Not required
Spall catch box: Not required
Witness / Box Distance: Not required
Spall Occurrence: No spall occurred
Test Temperature: 70 ° F
Test Date: December 06, 2019
Pass / Fail Results: Passed the Test
Comments: CFR Reference for UL Level 1 and EN1063 BR2 (9 mm)



NP = No Penetration
PP = Partial Penetration
CP = Complete Penetration
N/A = Not Applicable

Footnotes

\* Velocity measurements were taken at a distance of 6 feet from muzzle.
\*\* Impact Spacing is the distance between shots. (shot 1= N/A, shot 2 = 1 to 2)

Test and Report Engineers

Tested and Reported by: Sam Raheb

Signature: [Handwritten Signature]

Date: December 6, 2019

Name: **Midwest Glass Fabricators**

Report Date: **December 6, 2019**

**Ballistic Test Results and Photographs**

**Ballistic Test Results:**

Test Sample 4B passed the Underwriters Laboratory UL752 UL Level 1 Part 2 (9 mm Parabellum FMJ) Ballistic test. There was no complete penetration of the test sample from any of the 9 mm Parabellum FMJ caliber projectiles. Sample 4B was previously used for the 3 shot UL752 Part 1 test because sample 3 failed due to a brittle polycarbonate rear face ply. Refer to Sample 4A report for the UL752 Part 1 test.

**Witness Plate and Spall Effects:**

No spall occurred and no witness plate was required.

**Photographs**

The following photographs show the post-test sample. Additional larger sized photographs are included with this report.

**Sample 4B: MWGF-UL1-ENBR2 - D.O.M. November 25, 2019 - CFR UL Level 1 and EN BR2 - UL Level 1 Part 2 - 12.13 x 12.13 x 0.546 in.**



Sample 4B Post Test Impact Side



Sample 4B Post Test Rear Side

**Test and Report Engineers**

Tested and Reported by: **Sam Raheb**

Signature: *Sam Raheb*

Date: **December 6, 2019**